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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,980	03/21/2006	Ulrich Bast	4001-1211	2873
466	7590	03/17/2009	EXAMINER	
YOUNG & THOMPSON			KATZ, VERA	
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Suite 500			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/566,980	BAST ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Vera Katz	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
  - 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) \_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.
 

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) All    b) Some \* c) None of:
    1. Certified copies of the priority documents have been received.
    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____ .                                     |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/26/2006, 02/02/2006</u> .                                  | 6) <input type="checkbox"/> Other: ____ .                         |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 19 and 20 are objected to because of the following informalities; Claims 19 and 20 duplicate claims 17 and 18, respectively.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 5, 8 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Each of these claims recites a group which is an improper Markush group; see claim 1 line 12, claims 2, 8 and 9, line 3 and claim 5, lines 3-4. Claim 1 recites "...mixed oxide selected from the perovskite group with the empirical formula AA'O<sub>3</sub> and/or a pyrochlore with the empirical formula A<sub>2</sub>B<sub>2</sub>O<sub>7</sub>, A' being a trivalent metal and B a tetravalent metal". Claim 2 recites "an activator selected from the cerium and/or europium and/or dysprosium and/or terbium group". Claim 8 recites "the pyrochlore is selected from the rare earth hafnate and/or rare earth titanate and/or rare earth zirconate group". Claim 5 recites "the trivalent metal A' is a rare earth element selected from the lanthanum and/or gadolinium and/or samarium group". Claim 9 recites "the rare earth zirconate is selected from the gadolinium zirconate and/or samarium zirconate group". The conjunctions and/or make the claims uncertain and

indefinite. Alternative expressions are permitted if they present no uncertainty or ambiguity with respect to the question of scope or clarity of the claims. One acceptable form of alternative expression, which is commonly referred to as a Markush group, recites members as being “selected from the group consisting of A, B and C.” See *Ex parte Markush*, 1925 C.D. 126 (Comm'r Pat. 1925). It is improper to use the term “comprising” instead of “consisting of.” *Ex parte Dotter*, 12 USPQ 382 (Bd. App. 1931), MPEP 2173.05(h).

Alternative expressions using “or” are acceptable such as “wherein R is A, B, C, or D.” these phrases were each held to be acceptable and not in violation of 35 USC, second paragraph in *re Gaubert*, 524F.2d 1222, 187 USPQ 664 (CCPA 1975); MPEP 2173.05(h).

1. Claims 1 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1 and 11 recite the limitation "the empirical formula" in lines 12 and 13, "the perovskite" in line 11. There is insufficient antecedent basis for this limitation in the claim.

2. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitations “essentially luminophore-free” in claim 12, line 3 and “essentially opaque” in claim 13, line 3 render claims vague and unclear. For compact prosecution this claims will be examined as if a layer partially free

of luminophore is considered essentially luminophore free and parts of the layer that are not substantially transparent are essentially opaque.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 4, 5, 8-10, 11, 15, 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Maloney (6284323). Maloney discloses a material or an arrangement of thermal insulating or thermally barrier coating on metallic substrate; [abstract]. The recitation claims "for limiting heat transfer between the substrate and an environment of the substrate" is considered an intended use. This aspect has not been given patentable weight, since the thermal barrier coatings per se are known and the reference sets forth the same composition as instantly claimed. Maloney further teaches that a mixed oxide which is a pyrochlore with an empirical formula of  $A_2B_2O_7$  where A is a trivalent metal and B is a tetravalent metal is employed; [col.3, line 12]. Because this structure is similar to the claimed structure it is considered a luminophore or having the potential to be excited to emit luminescent light with a particular emission wavelength.

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Considering claim 4 and 5, Maloney teaches that a trivalent metal A of the pyrochlore of the formula  $A_2B_2O_7$  is a rare earth element selected from the lanthanum or gadolinium group; [col. 5, line 64 and col. 8, line 58].

Considering claim 8, the pyrochlore is a rare earth zirconate group such as lanthanum zirconate; [col. 8, line 2].

Considering claims 9 and 10, the reference further discloses that the material may be gadolinium zirconate or lanthanum hafnate; [col. 6, lines 15-19].

Considering claims 15 and 16, the reference teaches that the substrate is a component of a gas turbine engine; [col. 1, line 32, col. 2, line14]. The material is stable at the temperatures more than 4000°F; [col. 3, line 35] and is regarded as being useful for internal combustion engine applications.

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4. Claims 1, 4, 5, 6, 11, 12, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Heimberg (6440575).

As to claims 1, 4, 5, 11, Heimberg teaches a thermally insulating material for a thermal barrier coating of a substrate; [abstract]. The reference teaches that it can be used as a heat shield element and is considered to limit heat transfer between the substrate and an environment; [col. 3, line 38]. However, the recitation "for limiting heat transfer between the substrate and an environment of the substrate" is considered an intended use.

The reference further teaches that the thermally insulating material comprises a metal oxide that is a mixed oxide. The oxide is a perovskite with a formula  $AA'O_3$  such as  $LaAlO_3$ ; or  $LaGdAlO_3$  [col. 4, line 19 and 53 and col. 5, line 65]. La, Gd and Al are

trivalent metals A or A'. This structure is similar to the claimed structure and is considered a luminophore or having the potential to be excited to emit luminescent light with a particular emission wavelength. La and Gd are rare earth elements from lanthanum group and gadolinium group, respectively.

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As to claim 6, the perovskite comprises La and is a rare earth element.

As to claim 12, the reference teaches that additional layer such as aluminum nitride or chromium nitride layer can be employed; [col 4, line 62]. It is considered that this layer is essentially luminophore-free.

As to claims 15-16, the substrate is a component of a gas turbine engine; [col. 4, line 7].

5. Claims 1-3 and 11-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Choy; [WO 200006796].

As to claims 1 and 11, Choy teaches a thermally insulated material or thermal barrier coating on a substrate that is considered to be an arrangement. The thermal material is  $\text{Y}_2\text{O}_3$ -Eu; [p. 7, line 17]. Y is a trivalent metal A or A' from a perovskite group and is considered to be a luminophore.

As to claims 2-3, Choy teaches that the luminophore is doped with europium which participates in the exiting the emission of luminescent light at with a particular wavelength; [p. 8, line 12]. The concentration of europium is 6% that is within the applicant's claimed range; [col. 8, line 12].

As to claim 12, Figs 11 and 12 teaches an additional thermal barrier coating (TBC), 270 or 230. The teaching further provides that the indicator material can form

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part of the layer; [p. 3, line 4]. It is regarded that by providing only a part of the TBC layer with the indicator makes the rest of the layer luminophore-free and the entire layer substantially luminophore free.

As to claim 13 and 14, the reference teaches that only a region of the additional coating 280 is substantially transparent; [p. 9, line 18]. It is considered that the rest of the coating layer 270 or the entire coating layer 230 is essentially opaque to the excitation light. The excitation light passes only through parts 240 or 280, 290 of the additional layer 270 or 230 that are regarded an orifice. Also, as taught by the reference, the material of the cover layer may be partially transparent to the light; [p. 4, line 3].

As to claims 15-16, the substrate is a part of a combustion engine, such as blade or heat shield and, in particular, a gas turbine; [p. 4, lines 5-9].

As to claims 17-20, the teaching shows that the perovskite may comprise a rare earth element; [p. 10, line 13].

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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6. Claims 2, 3, 7, 13, 14, 17-20 are rejected under 35 U.S.C. 103(a) as obvious over Heimberg (6440575) in view of Choy; [WO 200006796].

As it was shown above, Heimberg teaches all the limitations of claims 1, 11 and 12, but fails to teach an activator selected from a specific group. However, Choy teaches the activator being europium dopant added in the amount of 6%; [p. 8, line 12]. It would have been obvious to one of ordinary skill in the art to modify the TBC coatings of Heimberg by adding europium dopant of Choy to allow studying and remote monitoring of the physical parameter by directing a light beam onto the component and analyzing the fluorescence spectrum by known techniques; [Choy, p. 2 and 3, lines 31 and 1, respectively].

Considering claim 7, Heimberg teaches the formula of the rare earth aluminate is  $\text{Ga}_x \text{La}_{1-x}\text{AlO}_3$ ; [col. 4, line 54]. . The claimed formula of  $\text{Ga}_{0.25} \text{La}_{0.75}\text{AlO}_3$  is within the claimed range. Heimberg does not specifically teach the above recited formula, however, it would have been obvious to one of ordinary skill in the art that the range of x to be from 0 to 1, because if x=0, then the formula would be  $\text{LaAlO}_3$  and if x=1, the formula would be  $\text{GaAlO}_3$ . Both oxides above are binary oxides If the oxide is a mixed ternary oxide as it is in the art, then x should fall between 0 and 1. Therefore, if x is equal to 0.25 then the empirical formula of mixed oxide is  $\text{Ga}_{0.25} \text{La}_{0.75}\text{AlO}_3$  as in the instant claim 7. The range of x overlaps with the instant range of x at 0.25.

Alternatively, it would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the point within the ranges disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of

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obviousness, *In re Malagari*, 182 USPQ 549. Furthermore, it would have been obvious to one of ordinary skill in the art at the time of the invention to optimize the formula to provide a chemically stable material; [col. 4, line 58].

Considering claims 17-20, Heimberg discloses that the perovskite comprises La and is a rare earth element.

As to claim 13 and 14, Choy discloses an additional TBC with only a region of the additional coating 280 being substantially transparent; [p. 9, line 18]. The rest of the coating layer 270 or the entire coating layer 230 is considered to be essentially opaque to the excitation light. The excitation light passes only through parts 240 or 280, 290 of the additional layer 270 or 230. The general meaning of the orifice is a hole or a vent , therefore because the parts above are holes or vents to the excitation light they are regarded as orifices.

### ***Double Patenting***

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 16-33 of copending Application No. 10/564413. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims are not patentably distinct. For example, claim 16 of 10/564413 recites luminescent substance, while instant claim 13 recites luminophore. The luminophore and luminescent material are considered to be equivalent in scope.

9. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, see attached form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Katz whose telephone number is (571)270-7082. The examiner can normally be reached on M - Th 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JENNIFER McNEIL can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Vera Katz/  
Examiner, Art Unit 1794

/JENNIFER MCNEIL/  
Supervisory Patent Examiner, Art Unit 1794